

We present new theoretical estimates of the contribution of unresolved star-forming galaxies to the extragalactic gamma-ray background (EGB) as measured by EGRET and the Fermi-LAT. We employ several methods for determining the star-forming galaxy contribution to the EGB, including a method positing a correlation between the gamma-ray luminosity of a galaxy and its rate of star formation as calculated from the total infrared luminosity, and a method that makes use of a model of the evolution of the galaxy gas mass with cosmic time. We find that depending on the model, unresolved star-forming galaxies could contribute significantly to the EGB as measured by the Fermi-LAT at energies between ~ 300 MeV and \sim few GeV. However, the overall spectrum of unresolved star-forming galaxies can explain neither the EGRET EGB spectrum at energies between 50 and 200 MeV nor the Fermi-LAT EGB spectrum at energies above \sim few GeV.

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